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EXAMINER	
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ART UNIT	PAPER NUMBER
1637	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,471	EBBINGHAUS ET AL.	
	Examiner	Art Unit	
	Angela Bertagna	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *12-18* is/are withdrawn from consideration.

5)☒ Claim(s) *27 and 29-31* is/are allowed.

6)☒ Claim(s) *1,3-11 and 19-26* is/are rejected.

7)☒ Claim(s) *2,5,22,25 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

1. Claims 1-31 are currently pending. Claims 1-8, 10-16, 19-21, 25, and 26 were amended in the response filed July 10, 2006. Claims 27-31 are new. This Office Action is made non-final due to the inclusion of new grounds of rejection not necessitated by amendment.

Election/Restrictions

2. Applicant's affirmation of the provisional election with traverse of Group I, claims 1-11 and 19-26 and SEQ ID NO: 16 in the reply filed on July 10, 2006 is acknowledged. The traversal is on the ground(s) that: (1) Groups I and II are now coextensive in scope, and therefore should be examined together and (2) since the elected SEQ ID NO: 16 was indicated to be free of the prior art, additional nucleic acid sequences should be included in the search. These arguments are not found persuasive. Regarding the first point, a search for Groups I and II is not coextensive. Group I is directed to a compound screening method, whereas Group II is directed to a method of modulating transcription using a compound identified by the screening method of Group I. These methods require a different search of the prior art and also require consideration of different patentability issues (i.e. 112, 1st paragraph issues not present in Group I may be present in Group II). Therefore, a search of Groups I and II simultaneously would impose a serious search and examination burden. Regarding the second point, as discussed previously, the election of a specific sequence is not subject to rejoinder under Markush practice, because the different sequences are structurally and functionally different compounds that do not share a common core structure, and therefore, constitute separate inventions rather than distinct species.

Also, as discussed previously, a search of all claimed sequences would pose an enormous burden on the examiner and the PTO search resources.

The requirement is still deemed proper and is therefore made FINAL.

Claims 12-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on July 10, 2006.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

3. Claims 2, 22, 25, and 28 are objected to because of the following informalities: These claims recite non-elected subject matter, specifically non-elected nucleic acid sequences. Appropriate correction is required.

Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 5 recites "the method of claim 4, wherein the quadruplex DNA comprises a gene transcription regulatory nucleotide sequence found in native quadruplex

DNA." Since claim 4 recites "the quadruplex DNA comprises a gene transcription regulatory nucleotide sequence in native quadruplex DNA", it is unclear how claim 5 further limits claim 4.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 22-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Siddiqui-Jain et al. (US 2004/0005601 A1). This pre-grant publication obtains benefit of Provisional Application No. 60/370,358, filed April 5, 2002.

The applied reference has two common inventors (Adam Siddiqui-Jain and Laurence Hurley) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 22, Siddiqui-Jain teaches a method for identifying a nucleotide sequence capable of forming a quadruplex structure, which comprises identifying in a database a subset of nucleotide sequences comprising $(GGA)_4$, or $(GGA)_3GG$, wherein n is an integer between 0 and

3 (paragraph 44 teaches identification; the $(G_aX_b)_cG_a$ motif in paragraph 32 inherently includes the $(GGA)_3GG$ sequence).

Regarding claim 23, Siddiqui-Jain teaches that the method of claim 22 further comprises identifying nucleotide sequences from the subset of nucleotide sequences adjacent to a gene coding region (paragraph 44). Also, the test quadruplex sequences used as query sequences are derived from regulatory sequences adjacent to a gene coding region (paragraph 30).

Regarding claim 24, Siddiqui-Jain teaches that the method of claim 22 further comprises identifying nucleotide sequences from the subset of nucleotide sequences identical to or substantially identical to an oncogene nucleotide sequence (paragraph 44). Also, the test quadruplex query sequences are derived from oncogenes (paragraph 30).

Regarding claim 25, Siddiqui-Jain teaches a method for identifying a nucleotide sequence capable of forming a quadruplex structure, which comprises:

(a) contacting a cell with a quadruplex interacting agent (Example 4, paragraph 106)

(b) identifying a subset of RNA nucleotide sequences increased or decreased 2-fold or more in the cell as compared to a cell not contacted with the quadruplex interacting agent (Example 4, paragraph 107-108)

(c) identifying a nucleotide sequence from the subset comprising $(GGA)_4$, or $(GGA)_3GG$ as the nucleotide sequence capable of forming a quadruplex structure.

Although Example 4 does not teach "identification of a nucleotide sequence from the subset comprising $(GGA)_4$, or $(GGA)_3GG$ as the nucleotide sequence capable of forming a quadruplex structure", a general method is provided in paragraphs 74 and 88 for contacting cells with a quadruplex interacting agent, measuring the resulting transcriptional levels, and thereby,

identifying a nucleotide sequence capable of forming a quadruplex structure. The $(GGA)_3GG$ sequence is included in the group of test quadruplexes defined in paragraph 32.

Regarding claim 26, Siddiqui-Jain teaches that the quadruplex interacting agent is TMPyP4 or telomestatin (Example 4, paragraph 106).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 3-11, and 19-21 are rejected under 35 U.S.C. 103(a) as being obvious over Siddiqui-Jain et al. (US Pub No. 2004/0005601 A1; cited previously) in view of Matsugami et al. (Journal of Molecular Biology (October 2001) 313: 255-269; cited previously). The Siddiqui-Jain reference obtains benefit of Provisonal Application No. 60/370,358, filed on April 5, 2002.

The applied reference has two common inventors (Adam Siddiqui-Jain and Laurence Hurley) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Siddiqui-Jain teaches a method of identifying compounds that modulate the biological activity of quadruplex DNA (see abstract).

Regarding claim 1, Siddiqui-Jain teaches a method for identifying a molecule that modulates transcription, comprising:

(a) providing a quadruplex DNA and a candidate quadruplex DNA-binding molecule, wherein the quadruplex DNA comprises the nucleotide sequence $(GGA)_4$ or the sequence $(GGA)_3GG$ and G is guanine and A is adenine (see paragraphs 14 and 32, where the $(G_aX_b)_cG_a$ motif includes the $(GGA)_3GG$ sequence)

(b) contacting the quadruplex DNA with the candidate quadruplex DNA-binding molecule (paragraph 14)

(c) determining the presence or absence of an interaction between the candidate quadruplex DNA-binding molecule and the quadruplex DNA, whereby the candidate molecule that interacts with the quadruplex DNA is identified as a molecule that modulates transcription (see paragraphs 14 and 32; paragraphs 16, 30, 74, and 77 teach that the quadruplex modulates transcription).

Regarding claim 3, Siddiqui-Jain teaches that the quadruplex DNA comprises a native quadruplex DNA sequence (paragraph 30).

Regarding claims 4 and 5, Siddiqui-Jain teaches that the quadruplex DNA comprises a gene transcription regulatory nucleotide sequence in native quadruplex DNA (paragraph 30).

Regarding claim 7, Siddiqui-Jain teaches that the quadruplex DNA comprises a mutation that hinders formation of another quadruplex conformation (paragraph 33).

Regarding claim 8, Siddiqui-Jain teaches that the quadruplex DNA is coupled to a reporter expression system (paragraph 77).

Regarding claim 9, Siddiqui-Jain teaches that the reporter expression system comprises a luciferase reporter (paragraph 77).

Regarding claim 10, Siddiqui-Jain teaches that the interaction is assayed by a Taq polymerase arrest assay (paragraph 76).

Regarding claim 11, Siddiqui-Jain teaches that the interaction is a binding interaction (paragraph 74).

Regarding claim 19, Siddiqui-Jain teaches a method for identifying the presence or absence of a quadruplex structure in a nucleic acid of a sample, comprising:

(a) providing a sample comprising a nucleic acid and a quadruplex-interacting agent (paragraphs 14 and 74)

(b) contacting the sample with the quadruplex-interacting agent (paragraphs 14 and 74)

(c) detecting the presence or absence of an interaction between the nucleic acid quadruplex structure and the quadruplex-interacting agent, whereby the presence of an interaction is indicative of the quadruplex structure in the nucleic acid (paragraphs 14 and 74).

Regarding claim 20, Siddiqui-Jain teaches that the quadruplex-interacting agent comprises TMPyP4 or telomestatin (Example 4, paragraph 106).

Regarding claims 1, 19, and 21, Siddiqui-Jain teaches that the quadruplex DNA is in the chair conformation rather than a heptad/tetrad conformation.

Matsugami et al. teach the structure of a quadruplex of $(GGA)_4$ in a heptad/tetrad conformation (abstract). This sequence was incubated in solutions containing physiological concentrations of potassium ions (100 mM) and in solutions lacking potassium ions and the resulting NMR spectra were compared (Figure 1, page 256).

It would have been prima facie obvious for one of ordinary skill in the art at the time of invention to utilize the $(GGA)_3GG$ quadruplex DNA taught by Siddiqui-Jain in a heptad/tetrad conformation. Matsugami taught that a highly similar quadruplex structure, $(GGA)_4$, adopted a

heptad/tetrad conformation in the presence of physiological potassium concentrations, thereby leading Matsugami to propose that the heptad/tetrad conformation was the biologically relevant conformation. Thoe ordinary practitioner of the methods taught by Siddiqui-Jain would have been motivated by these teachings of Matsugami to modulate the potassium concentration in order to obtain the ability to conduct the compound screening and transcriptional repression assays using the most biologically relevant conformation of the quadruplex DNA (the heptad/tetrad conformation). Since Siddiqui-Jain expressly taught the importance of conducting the assays using the biologically relevant quadruplex conformation (see paragraphs 38 and 99), the teachings of Matsugami regarding the heptad/tetrad conformation would have been particularly relevant.

8. Claims 1, 3-7, 10, 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerwin et al. (US Patent No. 6,156,763) in view Matsugami et al. (Journal of Molecular Biology, October 2001).

Kerwin teaches a method of identifiying quadruplex-interacting molecules (see abstract).

Regarding claim 1, Kerwin teaches a method for identifying a molecule that modulates transcription, comprising:

(a) providing a quadruplex DNA and a candidate quadruplex DNA-binding molecule (column 2, line 66 – column 3, line 2)

(b) contacting the quadruplex DNA with the candidate quadruplex DNA-binding molecule (column 2, line 66 – column 3, line 2)

(c) determining the presence or absence of an interaction between the candidate quadruplex DNA-binding molecule and the quadruplex DNA, whereby the candidate molecule that interacts with the quadruplex DNA is identified as a molecule that modulates transcription (column 2, line 66 – column 3, line 2 teach determination of an interaction; column 10, lines 15-19 teach that quadruplex DNA structures modulate transcription).

Regarding claim 3, Kerwin teaches that the quadruplex DNA comprises a native quadruplex DNA sequence (column 10, lines 44-55).

Regarding claims 4 and 5, Kerwin teaches that the quadruplex DNA comprises a gene transcription regulatory nucleotide sequence in native quadruplex DNA (column 10, lines 44-55).

Regarding claim 7, Kerwin teaches that the quadruplex DNA comprises a mutation that hinders formation of another quadruplex conformation (column 28, lines 27-48).

Regarding claim 10, Kerwin teaches that the interaction is assayed by a Taq polymerase arrest assay (Example 4, column 23, lines 18-54).

Regarding claim 11, Kerwin teaches that the interaction is a binding interaction (Example 6, column 24, lines 24-58).

Regarding claim 19, Kerwin teaches a method for identifying the presence or absence of a quadruplex structure in a nucleic acid of a sample (see Example 5, columns 23-24), comprising:

(a) providing a sample comprising a nucleic acid and a quadruplex-interacting agent (column 23, line 55 – column 24, line 14; the nucleic acid is the quadruplex G4A and the quadruplex interacting agent is TMPyP4)

(b) contacting the sample with the quadruplex-interacting agent (column 24, lines 6-14)

(c) detecting the presence or absence of an interaction between the nucleic acid quadruplex structure and the quadruplex-interacting agent, whereby the presence of an interaction is indicative of the quadruplex structure in the nucleic acid (column 24, lines 14-24).

Regarding claim 20, Kerwin teaches that the quadruplex-interacting agent comprises TMPyP4 or telomestatin (column 24, lines 13-14).

Regarding claims 1, 6, and 19, Kerwin teaches quadruplex molecules other than the instantly claimed $(GGA)_4$ or $(GGA)_3GG$. Kerwin also does not teach that the quadruplex DNA molecules are in a heptad/tetrad conformation.

Matsugami et al. teach the structure of a quadruplex of $(GGA)_4$ in a heptad/tetrad conformation (abstract). The sequence was incubated in solutions containing physiological concentrations of potassium ions (100 mM) and in solutions lacking potassium ions and the resulting NMR spectra were compared (Figure 1, page 256).

It would have been prima facie obvious for one of ordinary skill in the art at the time of invention to use the $(GGA)_4$ quadruplex in a heptad/tetrad conformation taught by Matsugami in the method of Kerwin. The method of Kerwin was particularly directed to identifying quadruplex-interacting compounds in order to treat a range of disorders suspected to involve quadruplex DNA structures (column 2, lines 45-56, column 16, lines 47-59, and column 18, lines 56-61 of Kerwin). The ordinary practitioner would have been motivated to utilize any known

quadruplex DNA sequence in the method of Kerwin in order to expand the ability of the method to identify therapeutically useful compounds, and therefore, the teaching of Matsugami that the GGA4 sequence formed a quadruplex would have suggested use of this sequence to the ordinary practitioner of the method of Kerwin. The ordinary practitioner would also have been motivated by the teachings of Kerwin to use the GGA4 quadruplex in a heptad/tetrad conformation, since Matsugami taught that this was the biologically relevant conformation of the quadruplex. The ordinary practitioner of the method of Kerwin would have been motivated to use the biologically relevant form of the complex in order to identify and determine the efficacy of candidate compounds in the most biologically relevant setting.

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerwin et al. (US Patent No. 6,156,763) in view Matsugami et al. (Journal of Molecular Biology, October 2001) and further in view of Williams et al. (Analytical Biochemistry (1989) 176: 28-32; newly cited).

The combined teachings of Kerwin and Matsugami result in the method of claim 1, as discussed above.

Neither of the above references teaches that the quadruplex DNA is coupled to a luciferase reporter system.

Willaims teaches the use of firefly luciferase as a reporter gene for monitoring expression in transfected cells (see abstract). Williams states, "The luciferase system is a simple, rapid, and sensitive method for the study of promoter activity in transfected cells (see abstract)."

It would have been prima facie obvious for one of ordinary skill in the art at the time of invention to utilize a luciferase reporter system as taught by Williams to monitor the effect of the candidate compounds on the expression of the targeted quadruplex DNA molecules. Kerwin expressly taught monitoring the effect of the candidate compounds in transfected cells, but measured growth rather than expression level (see column 20, lines 22-36). The ordinary practitioner would have been motivated to monitor expression alternatively or in addition to monitoring cell growth in order to obtain a more accurate and complete measure of the effect of the compounds on the quadruplex structure. In particular, the ordinary practitioner would have been motivated to monitor expression using the luciferase reporter system, since Williams taught that the system was fast, simple and highly sensitive.

10. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weitzmann et al. (Journal of Biological Chemistry (1996) 271(34): 20958-20964; cited on IDS) in view of either of Matsugami et al. (Journal of Molecular Biology (October 2001) 313: 255-269) or Lee et al. (Nucleic Acids Research (1990) 18(20): 6057-6060; newly cited).

Weitzmann teaches a method for identifying a nucleotide sequence capable of forming a quadruplex structure (see abstract).

Regarding claim 22, the method of Weitzmann comprises identifying the quadruplex-forming sequence in a database of nucleotide sequences (see page 20964 and Table 1).

Regarding claim 23, Weitzmann analyzed nucleotide sequences adjacent to a gene coding region (see Table 1 on page 20962, where 5' regulatory regions/promoters were analyzed).

Regarding claim 24, Weitzmann identified a quadruplex-forming sequence in the human R-ras oncogene (see Table 1).

The quadruplex-forming sequences identified by Weitzmann do not include the $(GGA)_4$ motif or the $(GGA)_3GG$ motif.

Matsugami taught that the $(GGA)_4$ motif was highly repeated in eukaryotic genomic sequences and formed a quadruplex structure at physiological potassium concentrations (see abstract, page 255 and 265).

Lee taught that the poly(GGA) sequence formed a quadruplex structure also at physiological potassium concentrations (see abstract and Table 1).

It would have been prima facie obvious for the person of ordinary skill in the art at the time of invention to identify the $(GGA)_4$ motif in a database of nucleic acid sequences using the method of Weitzmann. The method of Weitzmann was directed to identifying novel quadruplex-forming sequences (see Table 1 and page 20964). Since Matsugami and Lee separately taught that the $(GGA)_4$ sequence was highly repeated in eurkaryotic sequences and formed a quadruplex structure under physiological potassium ion concentrations, the ordinary practitioner would have been motivated to additionally identify the $(GGA)_4$ motif in order to obtain a more complete set of quadruplex-forming sequences present in a given subset of nucleotide sequences. Since Weitzmann taught that the quadruplex-forming sequences identified in Table 1 could play a

critical role in important biological processes such as transcriptional control, the ordinary practitioner would have been motivated to identify as many quadruplex-forming sequences as possible, in order to accurately assess the distribution and potential function of these sequences in the genome.

11. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izbicka et al. (Anti-Cancer Drug Design (1999) ; newly cited) in view of either of Matsugami et al. (Journal of Molecular Biology (October 2001) 313: 255-269) or Lee (Nucleic Acids Research (1990) 18(20): 6057-6060).

Izbicka teaches a method for monitoring the effect of quadruplex interacting agents on cell proliferation rates (see abstract).

Regarding claims 25 and 26, Izbicka teaches a method for identifying a sequence capable of forming a quadruplex structure comprising: (a) contacting a cell with the quadruplex-interacting agent TMPyP4 and (b) identifying a subset of RNA sequences increased or decreased compared to a normal control (see abstract, Figure 1 and pages 357-359).

Izbicka does not teach identification of the (GGA)4 motif or the (GGA)3GG motif as the quadruplex forming sequence.

Matsugami taught that the $(GGA)_4$ motif was highly repeated in eukaryotic genomic sequences and formed a quadruplex structure at physiological potassium concentrations (see abstract, page 255 and 265).

Lee taught that the poly(GGA) sequence formed a quadruplex structure also at physiological potassium concentrations (see abstract and Table 1).

It would have been prima facie obvious for the person of ordinary skill in the art at the time of invention to target (and thereby identify) the $(GGA)_4$ motif as a quadruplex structure using the method of Izbicka. The method taught by Izbicka identified quadruplex structures based on their ability to bind known quadruplex-interacting molecules, such TMPyP4, the ordinary practitioner would have been motivated to apply this method to any known or suspected quadruplex-forming sequence, such as the (GGA)4 motif taught by Matsugami or Lee. An ordinary practitioner would have been motivated to do so in order to confirm/identify the presence of quadruplex-forming sequences in a test cell.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3-6, and 8-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 92-94 and 98-103 of copending Application No. 10/407,449. Although the conflicting claims are not identical, they are not patentably distinct from each other, because claims 92, 93 and 103 of the '449 application recite a specific embodiment of the method recited in the instant claim 1, and therefore, anticipate this claim. Claim 94 of the '449 application corresponds to the instant claims 3-5. Claim 98 of the '449 application corresponds to the instant claim 6. Claims 99-102 of the '449 application correspond to the instant claims 8-11, respectively.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

Claims 27 and 29-31 are allowed.

Claims 2 and 28 contain allowable subject matter (SEQ ID NO: 16, as discussed in the previous Office Action). Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 2 and 28 require deletion of non-elected subject matter, as discussed above.

Response to Arguments

Claim Objections

Applicant's arguments, see page 17, filed July 10, 2006, with respect to the objections to claims 2 and 25 have been fully considered and are persuasive. The previously made objections have been withdrawn.

Claim Rejections under 35 USC 102

A. Siddiqui-Jain reference

Applicant's arguments, see page 17, filed July 10, 2006, with respect to claims 1, 3, 4, 7-11, 19, and 20 have been fully considered and are persuasive. Siddiqui-Jain does not teach all of the elements of the amended claims 1 and 19, specifically the heptad/tetrad conformation. Therefore, the previously made rejections have been withdrawn.

Applicant's arguments filed July 10, 2006 have been fully considered but they are not persuasive. Applicant argues that the amendments to the claims overcome the rejections under 102(e) of claims 22-26. This argument has not been found to be persuasive, because claim 22 and those claims dependent therefrom (claims 23 and 24) have not been amended. Therefore, the previously cited portions of the Siddiqui-Jain reference are still relevant, and these claims remain anticipated by this prior art source. Likewise, claim 25 and the dependent claim 26 have only been amended to correct grammatical errors. Therefore, the previously cited portions of the Siddiqui-Jain reference are still relevant, and these claims remain anticipated by this prior art source. The rejection of claims 22-26 under 35 USC 102(e) as anticipated by Siddiqui-Jain et al. is maintained.

B. Kerwin reference

Applicant's arguments, see pages 17-18, filed July 10, 2006, with respect to the rejection of claims 19 and 20 as anticipated by Kerwin have been fully considered and are persuasive. Kerwin does not teach all of the elements of the amended claim 19, and therefore the previously made rejections have been withdrawn.

Claim Rejections under 35 USC 103

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Obviousness-type Double Patenting

Applicant's election to postpone addressing the provisional obviousness-type double patenting rejection until claims are allowed has been noted. Since the rejection is still deemed proper, it has been reiterated above.

Conclusion

Claims 1, 3-11, and 19-26 are rejected. Claims 2, 22, 25, and 28 are objected to. Claims 27 and 29-31 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela Bertagna whose telephone number is (571) 272-8291. The examiner can normally be reached on M-F 7:30-5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Angela Bertagna
Examiner, Art Unit 1637
September 21, 2006

amb

JEFFREY FREDMAN
PRIMARY EXAMINER